

TAXONOMIC STUDIES ON THE JAPANESE ORIBATID MITES WEARING NYMPHAL EXUVIAE I. *HETEROBELBA* *STELLIFERA* SP. N.

By

Toshitsugu OKAYAMA

Department of Soil Zoology, Institute of Environmental Science
and Technology, Yokohama National University

Synopsis

OKAYAMA, Toshitsugu (Department of Soil Zoology, Institute of Environmental Science and Technology, Yokohama National University, Yokohama, Kanagawa 240, Japan): Taxonomic studies on the Japanese oribatid mites wearing nymphal exuviae I. *Heterobelba stellifera* sp. n. *Acta Arachnol.*, 29: 83-89 (1980).

A new species of oribatid mite, *Heterobelba stellifera* (Oribatida: Heterobelbidae), is described from Japan. A key to the species of the genus *Heterobelba* BERLESE is also given.

The original description of *Heterobelba africana* BALOGH, 1958 was so short and inadequate without any figure that BECK (1962) could not include the species in his key. But the figures of the species given later by BALOGH (1965) and MAHUNKA (1974) are helpful to recognize it. The species collected from various parts of Japan resembles *H. africana*, but some distinguishing characters enable the author to establish a new species.

The writer is deeply indebted to Prof. Dr. Jun-ichi AOKI of Yokohama National University, whose kind instruction has been indispensable for this task. He also wishes to express his hearty thanks to Dr. Keiko NIJIMA (Forestry and Forest Products Research Institute), Mr. Tohru TAKAHASHI (Tomioka High School), and Mr. Masamichi ITO (Tokyo University of Agriculture and Technology) for providing him with precious materials.

Heterobelba stellifera sp. n.

(Figs. 1-7)

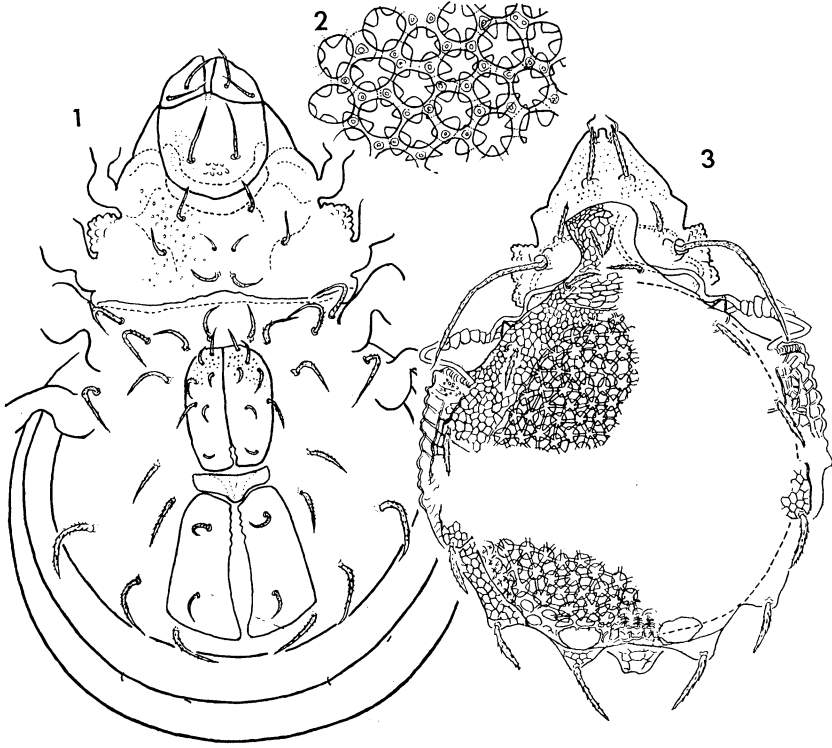
Heterobelba sp. A: OKAYAMA, 1980, p. 20.*Mesurement.* Length: 390-420 μ ; width: 250-280 μ .

Prodorsum. Rostrum somewhat truncate with a pair of incisions. Rostral seta, originating on a small apophysis just posterolateral to the incision, strongly elbowed and the distal 1/3 part of curly shape bent inward; the remaining basal part of the rostral seta very weakly barbed. Lamellar setae a little longer than their mutual distance, originating from a pair of well-developed apophyses and directed anteriorad. Lamellar seta strongly and densely barbed throughout its length. Interlamellar setae, each originating on a apophysis near bothridium, also densely barbed and much shorter than their mutual distance. Lamellar seta twice as long as and thicker than interlamellar seta. Sensillus filiform, gradually attenuating to the distal part and densely bearing fine barbs. Barbation of sensillus becomes denser to the basal portion. Bothridium opening to the latero-dorsal direction. An arched ridge connecting bothridia; its median part becomes faint. Between legs I and II found a rounded protrusion, which has a knotty surface (Fig. 1, 6). Another smaller protrusion found between legs III and IV. Granules of cerotegment arranged rather sparsely and irregularly on prodorsum. Exobothridial seta short and fine, originating on a small apophysis. A short, longitudinal and weakly arched ridge found behind bothridium.

Notogaster. Notogaster hemispherical, well swollen, glabrous without sculpture. Only three pairs of minute setae are found in ventral view near its posterior margin (Fig. 1). A pair of triangular projections (spinae adanatae), small and directed anterolaterally, exist on the anterior margin of notogaster.

Anogenital region. Anal and genital openings longer than wide. The former somewhat larger than the latter. Between the two openings exists preanal plate, which is as wide as genital aperture and four-cornered with a posterior projection. The anterior half of genital plate provided with granules. Genito-anal chaetotaxy: (7-2-2-3); there are two pairs of aggenital setae. Anogenital setae more or less roughened, but never strongly barbed (Fig. 1). Among the setae on anogenital region, adanal setae the longest and thickest, fairly roughened; ad_1 situated posterior to anal opening.

Epimeral region and gnathosoma. Epimerata *ep.* 1 and *ep.* 2 as well as *ep.* 3 and *ep.* 4 fused; only apodemata SJ recognized as a transverse ridge. Ten

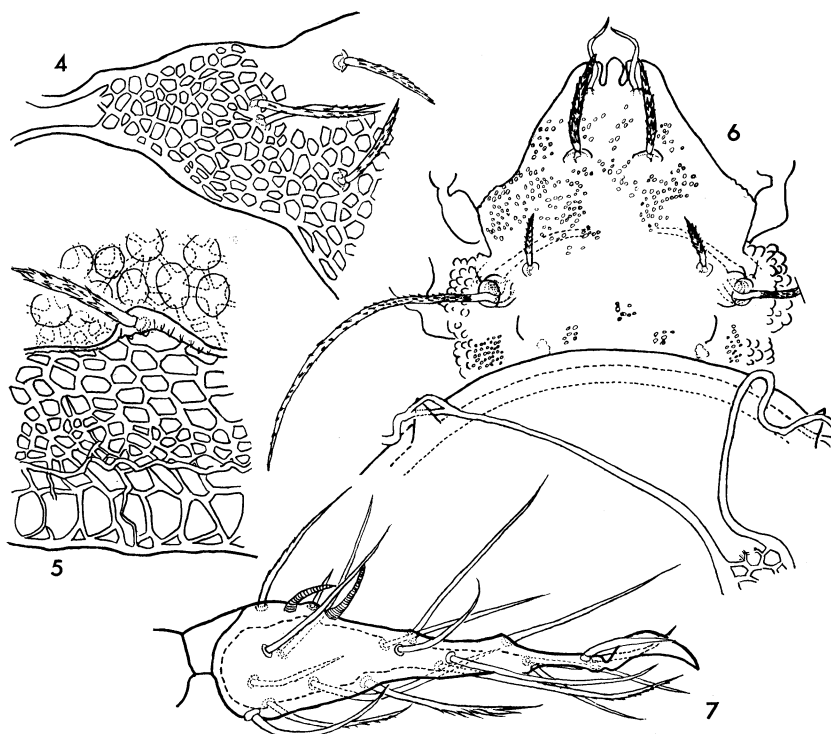


Figs. 1-3. *Heterobelba stellifera* sp. n. 1. Ventral view. 2. Central part of nymphal exuviae (deutonymphal exuvia overlaid on tritonymphal exuvia). 3. Dorsal view with nymphal exuviae.

pairs of setae are present on epimeral region, being roughened like the setae in anogenital region. Setae on gnathosoma slightly roughened. Granules of cerotegment are present on epimerata (I+II) and hypostom, becoming finer on the latter. Undulating lines of several granules exist near the posterior end of hypostom.

Legs. Legs densely covered with granules. Almost every segment equipped with thick and distinctly barbed setae. Some setae on tarsus I rather pectinate (Fig. 7). Leg IV has three claws, of which the median one is the biggest. The remaining legs monodactyle.

Nymphal exuviae. Transparent nymphal exuviae (two-layered in the middle) entirely covering notogaster and intruding beyond the anterior margin of notogaster onto the area between bothridia. Its anterior margin exceeding the



Figs. 4-7. *Heterobelba stellifera* sp. n. 4. Anterior part of tritonymphal exuvia (tensed backward and the folding released). 5. Lateral aspect of nymphal exuviae with seta *lp*. 6. Prodorsum. 7. Tarsus I (Paraxial side).

line connecting insertion pores for interlamellar setae, and folded down backwards, where a pair of strings originated (Fig. 3, 4). The string extends posterolaterally, holding around to *spina adanata* as seen in Fig. 6. The string becomes then wider and folded several times between *spina adanata* and humeral fusion to the exuvia (Fig. 3). The surface of tritonymphal exuvia reticulate; reticulation elongated in the anterior part over the dorsosejugal suture, polygonal in shape marginally, and almost triangular in the middle part (Fig. 3, 5). Deutonymphal exuvia seems to be fixed on tritonymphal exuvia, covering the triangular-patterned part entirely; the surface reticulation of deutonymphal exuvia, different in shape from that of tritonymph, forming a lot of circles; a tritonymphal asteroid core seen through each circle of deutonymphal exuvia (Fig. 2, 3). Tritonymphal exuvia provided marginally with 7 pairs of

thick setae, which are distinctly barbed. Two pairs of setae among them situated on the anterior projection of the exuvia; remaining 5 pairs longer, originating each on a well-developed protrusion, directed posteriorad and slightly bent inward. Caudal projection of tritonymphal exuvia has no setae, but some of the examined specimens showed a pair of distinct apophyses just like for setae. A pair of dome-shaped window made of thin film exist on the posterior part, just anterior to the posteriormost (among those recognized) pair of setae.

Material examined. Holotype (NSMT-Ac 9203, in spirit) and 1 paratopotype: Mt. Katsuragi, Nara Prefecture, 870 m, 19-VIII-1979, *ex* litter under grove of *Pinus densiflora*, T. OKAYAMA; 4 paratypes: Yugawara, Kanagawa Prefecture, 550 m, 19-IV-1980, *ex* litter under grove of *Pinus thunbergi*, M. ITO; 4 paratypes: Mt. Ishizuchi, Ehime Prefecture, 7-VIII-1969, J. AOKI; 1 paratype: Ohjiike, Miyake Island, 26-IX-1977, *ex* litter under grove of *Castanopsis sieboldi*, T. TAKAHASHI; 1 paratype: Mt. Kiyosumi, Chiba Prefecture, 26-III-1969, K. NIIJIMA; 1 paratype: Yaku Island, 14-XI-1974, J. AOKI. Holotype and a part of paratypes will be deposited in the National Science Museum, Tokyo.

Remarks. The new species shows a resemblance to *H. africana* BALOGH, 1958, in the aspect of barbed ventral setae, rostral incisions, and in the shape of lateral protrusions of propodosoma. But the latter is distinguishable from the former by these points: the lamellar setae much thicker and more strongly barbed than interlamellar setae; the interlamellar setae are long and reaching the insertion pores for lamellar setae; the rostral setae strongly barbed. The new species also distinguishable from its congeners by the key given below.

Key to the species of the Genus *Heterobelba* BERLESE

1. Sensillus bifurcate. Reticulation on tritonymphal exuvia shows a large and irregular pattern of mesh 2
- Sensillus not bifurcate. Reticulation on tritonymphal exuvia shows a regular pattern of mesh 3
2. Branches of sensillus unequal in length, one branch being distinctly longer than the other. Interlamellar seta thin *H. zikani* SELLNICK, 1922
- Branches of sensillus equal in length. Interlamella seta thick *H. furcata* MAHUNKA, 1978
3. Interlamellar seta short, never reaching the insertion pore for lamellar seta 4

- Interlamellar seta long, almost reaching the insertion pore for lamellar seta 6
- 4. Every seta on nymphal exuvia marginally situated 5
- A pair of setae on nymphal exuvia situated in the middle part *H. galerulta*, BERLSE, 1913
- 5. Interlamellar seta thick and distinctly barbed *H. stellifera* sp. n.
- Interlamellar seta thin and smooth *H. magna* BECK, 1962
- 6. Very thick and strongly barbed seta not exists on ventral side 7
- Very thick and strongly barbed setae (several pairs) exist on ventral side 8
- 7. Almost every seta on ventral side more or less roughened *H. africana* BALOGH, 1958
- Every seta (except one pair) on ventral side smooth and thin *H. oxapanpensis* BECK, 1962
- 8. Sensillus pectinate. Several pairs of bush-shaped setae exist on ventral side. Rostrum without incisions *H. barbata* BECK, 1962
- Sensillus strongly barbed but not pectinate. Several pairs of setae on ventral side thick and strongly barbed but never bush-shaped. Rostrum with a pair of incisions *H. crassisetosa* BECK, 1962

摘 要

岡山利次 (横浜国立大学環境科学研究センター) : 日本産の脱皮殻を背負ったササラダニ類の分類学的研究. I. アミメマントダニ (新称)。

ササラダニ類の中には、成虫が若虫時代の脱皮殻を背負っているものがあり、その方法もさまざまなものがある。本報は、そのような種の分類学的研究の第1報であり、関東、近畿、四国、三宅島、屋久島の標本から、アミメマントダニ (新種) *Heterobelba stellifera* sp. n. を記載した。なお、本属で種まで同定されたものは従来日本から報告されていなかった。熱帯産と考えられていた本属の種が日本各地から発見されたことは興味深い。

Literature

- BALOGH, J., 1958. Oribates nouvelles de l'Afrique tropicale. *Rev. Zool. Bot. Afr.*, 58: 1-34.
- 1965. A synopsis of the world oribatid (Acari) genera. *Acta. Zool. Acad. Sci. Hung.*, 11: 5-99.
- BECK, L., 1962. Beiträge zur Kenntnis der neotropischen Oribatidenfauna 2. Nothridae. Camisiidae, Heterobelbidae (Arach., Acari). *Senck. Biol.*, 43(5): 385-407.

- BERLESE, A., 1913. Acari nuovi. Manipoli VII-VIII. *Redia*, **9**: 77-111, pls. 1-8.
- MAHUNKA, S., 1974. Neue und interessante Milben aus dem Genfer Museum. XI Neue und wenig bekannte Oribatiden aus Rhodesien (Acari). *Arach. Sc. Genève*, **26**(3): 205-225.
- 1978. *Ditto*. XXIV First contribution to the oribatid fauna of the Dominican Republic (Acari: Oribatida). *Redia*, **61**: 551-564.
- OKAYAMA, T., 1980. Statistical analyses of the relation between oribatid communities and micro-environment. *Edaphologia*, (21): 17-28. (in Japanese with English synopsis)
- SELLNICK, M., 1922. Brasilianische Oribatidae. (Acar.) II *Heterobelba zikáni* n. sp. *Ent. Mitt.*, **11**(4): 179.